

REMARKS/ARGUMENTS

Claims 1-21 are pending in the present application. Claim 1 has been currently amended, and new Claim 21 has been added. Support for amended and new claims can be found thorough out the specification and in the original claims. Particular support for amended Claim 1 can be found in the specification on pages 2-5, and in Figures 4-10. Particular support for new Claim 21 can be found in the specification on page 6, and in Figures 4-10. No new matter is believed to have been introduced by the amended and new claims.

The specification was amended to provide a corrected description of Figure 12, as noted on pages 2 and 12. These amendments are supported throughout the specification and in the original claims. Particular support for these amendments is found in Figure 12. No new matter is believed to have been introduced by the amendments to the specification.

Applicants have filed, herewith, a Declaration under 37 C.F.R. § 1.132.

Claim Rejections under 35 U.S.C. § 102(b)

The Examiner rejected Claims 1, 2, 4-6 under 35 U.S.C. § 102(b), as anticipated by EP 0 922 671, using U.S. 6,383,280 as the unofficial English translation (hereinafter the '280 patent). Applicants respectfully traverse for the following reasons.

Claim 1 has been amended, in part, to recite that the silica particles are formed from silica dried in a pulse combustion dryer (or PCD). PCD-dried silica is different from silica dried by other conventional mechanisms. PCD-dried silica results in particles that are significantly more uniform in terms of size, shape and surface features. These particles show less irregularities in size and shape, and have smoother surface appearances, and less

indication of formation of hollow spheres (see pages 5 and 6, and Figures 4-10 of the present specification).

The '280 patent is directed to precipitated silica with the physico-chemical parameters as shown in the Abstract of this patent. This patent does not teach or suggest silica particles formed from silica dried in a pulse combustion dryer, and does not teach or suggest silica particles formed from silica dried in a pulse combustion dryer, in combination with the other features recited in Claim 1. The '280 patent discloses silica particles that are milled following spray drying (for example, see column 3, lines 22-23; column 13, lines 53-55 and claim 3). The '280 patent also discloses that a precipitated silica, in accordance with DE-A 31 44 299, is preferably used as the starting silica (for example, see column 1, lines 39-53; column 3, lines 24-25; and Examples 1, 2, 3, 4 and 5 (column 3, line 46 to column 4, line 14)). This patent further discloses that DE-A 31 44 299 describes precipitated silicas, and a process for preparing these precipitated silicas, and that when preparing these silicas, an Alpine transverse flow mill or a jet mill is used to mill the product, following spray drying (see column 1, lines 39-55).

Applicants provide herewith data in the form of a Declaration under 37 C.F.R. § 1.132, showing clearly that silica particles formed from silica dried in a pulse combustion dryer have more uniform structural features, for example, in terms of size, shape, sphericity and surface features, than silica particles formed from silica dried in a spray dryer. Applicants direct the Examiner's attention to Figures A-C of the Declaration, and Figures 6-8 of the invention. These figures show that silica particles dried in a spray dryer are predominantly irregular in shape, and have less uniformity in particle size, and surface features. These particles have significantly increased irregularity in size, shape and surface features compared to particles dried in pulse combustion dryer.

Applicants also direct the Examiner's attention to Figure M in the Declaration, which provides particle size distributions for silica dried in a pulse combustion dryer (cyclone) (initial eight grouping of bar graphs), compared to silica dried in a spray dryer (ninth grouping of bar graphs), silica dried by "floor drying and grinding" (tenth grouping of bar graphs) and initial silica suspensions (eleventh and twelfth groupings of bar graphs). As clearly seen, the use of a pulse combustion dryer results in particles with a significantly narrower particle size distribution, compared to the distribution of particles dried by the noted conventional means (spray drying and "floor drying and grinding"), and even results in narrower or comparable size distributions compared to the particle size distributions in the initial silica suspensions (see also Figure 12 of the invention). Applicants note that the particles size distributions for the particles, dried by the noted conventional means, are significantly broader than the size distributions for the initial silica suspensions, further indicating that the particles formed from silica dried in a pulse combustion dryer are clearly different from particles prepared from silica dried by conventional methods. The results presented in the Declaration are sufficient to rebut the Examiner's assertion of anticipation.

Thus, as shown by the comparison data in the attached Declaration, the silica particles of the invention, formed from silica dried in a pulse combustion dryer, differ from the silica particles formed from silica dried by conventional methods, such as spray drying, as disclosed in the '280 patent. The '280 patent does not teach or suggest drying silica in a pulse combustion dryer, and therefore cannot teach or suggest the silica particles as recited in the present claims. Thus, the '280 patent does not teach or suggest pending Claim 1, and does not teach or suggest pending Claims 2 and 4-6, which depend directly from Claim 1. Moreover, for the same reasons as discussed above, the '280 patent does not teach or suggest new Claim 21.

Therefore, for at least these reasons, the '280 patent does not teach or suggest the invention as now claimed, and the rejection should be withdrawn.

The Examiner rejected Claims 1-2, and 4-6 under 35 U.S.C. § 102(b), as anticipated by EP 0 901 986, using U.S. 6,180,076 as the unofficial English translation (hereinafter the '076 patent). Applicants respectfully traverse for the following reasons.

As discussed above, Claim 1 has been amended, in part, to recite that the silica particles are formed from silica dried in a pulse combustion dryer. As discussed above, PCD-dried silica is different from silica dried by other conventional mechanisms. PCD-dried silica results in particles that are significantly more uniform in terms of size, shape and surface features.

The '076 patent is directed to precipitated silica with the physico-chemical parameters as shown in the Abstract of this patent. This patent does not teach or suggest silica particles formed from silica dried in a pulse combustion dryer, and does not teach or suggest this feature in combination with the other features recited in Claim 1.

The '076 patent discloses that precipitated silica is filtered, washed and then dried, and optionally ground or granulated; and that, in a particularly preferred form, the precipitated silicas can be subject to flash drying (see column 2, lines 39-41 and 62-65). The '076 patent also discloses the following dryers: flow dryer, rack dryer, flash dryer, spin-flash dryer and spray dryer (see Claims 10 and 11 of this patent).

As discussed above, Applicants provide herewith data (micrographs and additional data) in the form of a Declaration under 37 C.F.R. § 1.132, comparing silica particles obtained by different drying mechanisms. Applicants note in the Declaration, that the drying method, short time drying (short time dryer), is used in Example 4 of the '076 patent. Silica particles dried in a pulse combustion dryer have more uniform structural features, for

example, in terms of size, shape, sphericity and surface features, compared to silica particles dried by a short time dryer. Applicants direct the Examiner's attention to Figures G-L of the Declaration, and Figures 6-8 of the invention. These figures (G-L) show that silica particles obtained from silica dried by short time drying, and such particles subsequently granulated, are predominantly irregular in shape, and have less uniformity in particle size. These particles have significantly increased irregularity in size, shape and surface features, than particles dried in a pulse combustion dryer. The PCD-dried particles exhibit a more uniform spherical body shape, and a significantly narrower particle size distribution. The results presented in the Declaration are sufficient to rebut the Examiner's assertion of anticipation.

Thus, as shown by the comparison data in the enclosed Declaration, the silica particles of the invention, formed from silica dried in a pulse combustion dryer, differ from the silica particles obtained by short time drying of the '076 patent. The '076 patent does not teach or suggest drying silica in a pulse combustion dryer, and therefore cannot teach or suggest the silica particles as recited in the present claims. Thus, the '076 patent does not teach or suggest pending Claim 1, and does not teach or suggest pending Claims 2 and 4-6, which depend directly from Claim 1. Moreover, for the same reasons as discussed above, the '076 patent does not teach or suggest new Claim 21.

Therefore, for at least these reasons, the '076 patent does not teach or suggest the invention as now claimed, and the rejection should be withdrawn.

Claim Rejections under 35 U.S.C. § 103(a)

The Examiner rejected Claims 1-6 under 35 U.S.C. § 103(a), as unpatentable over EP 0 901 986, in view U.S. 5,883,139 (hereinafter the '139 patent). Applicants respectfully traverse for the following reasons, using the '076 patent as the unofficial English translation of EP 0 901 986.

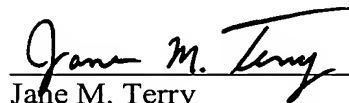
As discussed above, the '076 patent does not teach or suggest drying silica in a pulse combustion dryer, and therefore cannot teach or suggest the silica particles as recited in the present claims. The '139 patent is directed to rubber mixtures (see Abstract). The '139 patent does not teach or suggest drying silica in a pulse combustion dryer, and therefore does not overcome the deficiencies in the '076 patent. Therefore, for at least the above reasons, the combination of the '076 patent and the '139 patent does not teach or suggest the invention as now claimed, and the rejection should be withdrawn.

Applicants have shown in the attached Declaration that the silica dried in a pulse combustion dryer, is not the same as other forms of silica dried by conventional methods, and thus, have obviated the rejections under 35 U.S.C. § 102(b). Even if the Examiner asserts that it would be obvious to use any type of drying, the data provided clearly show that use of a pulse combustion dryer gives significantly improved properties/characteristics of the resultant silica particles, and thus any assertion of obviousness by the Examiner, based upon the art of record is rebutted, and all rejections should be withdrawn.

Applicants respectfully submit that the present amendment now places all claims in condition for allowance, and request early notice of such action.

Respectfully submitted,

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